

NEW HPLC - LINE

2015



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HPLC / GPC - SYSTEM

Vacuum degasser S 8515

Online Vacuum Degasser with high efficiency

HPLC - Pump System S 9425, S 9430

Isocratic HPLC Pump and Quaternary Gradient Pump

HPLC - Pumpe System S 9432

Binary High Pressure Gradient Pump

Auto sampler S 6250

Auto sampler S 6250 up to 60 samples

Autosampler S 6300

Autosampler S 6300 up to 120 samples

HPLC / GPC - Column oven S 5120

for analytical HPLC and GPC columns

HPLC / GPC C - Ofen 2002

for semi - preparative HPLC and GPC columns and column combinations

UV/Vis - Detektoren S 4245 and S 4250

PDA - Detektor S 4345 and S 4350

Refractive index detector S 2020

Refractive index detector RI 2000

Refractive index detector RI 2012

Evaporation - light scattering detector ZAM 3000

with programmable mass flow controller for additive gas flow

Evaporation - light scattering detector ZAM 4000

with fix additive gas flow

HPLC / GPC and other special columns

Clarity Chromatography Software

Clarity and GPC Extension software module

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S 8515 vacuum degasser

The **S 8515 vacuum degasser** is an online degasser system with high efficiency.

Dissolved gases are removed from the solvents by applying vacuum to a semi-permeable membrane.

High efficiency

The high efficient Teflon-AF® capillary has a much higher efficiency than a normal Teflon capillary of similar size.

This allows the usage of a smaller length of capillary to reduce the dead volume of the system considerably.



Figure: S 8515 vacuum degasser

Operation modes

The **S 8515 vacuum degasser** can be run either with constant speed or in hysteresis mode, which switches the vacuum pump on or off.

5-Year membrane warranty

The **S 8515** vacuum pump uses a membrane for creating the vacuum. This membrane is made of a specific Teflon material specifically designed for fast movements. Schambeck SFD GmbH offers a 5-year warranty on the lifetime of this membrane.

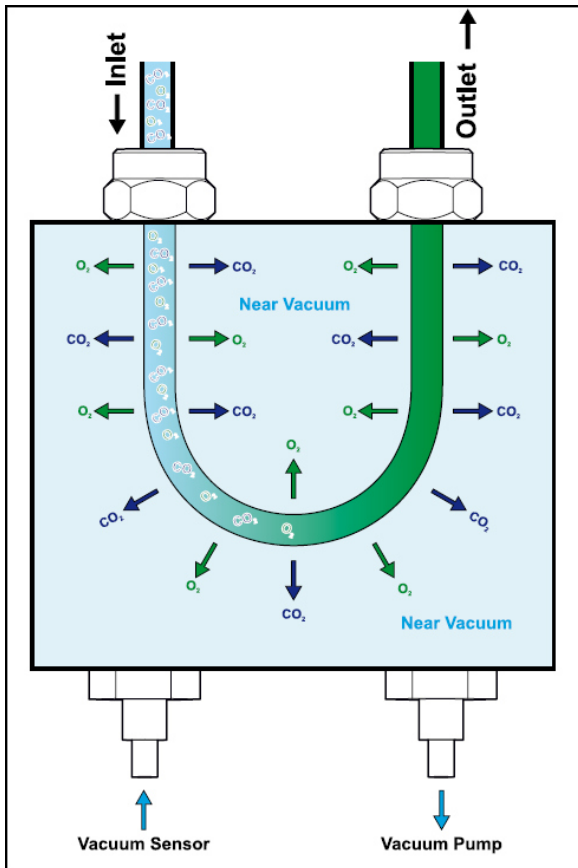
Multi - channel

The **S 8515 vacuum degasser** is available as 1-channel, 2-channel, 3-channel and 4-channel version and also in a PEEK—metal free version. Each solvent channel can be used for a different solvent or several channels can be used in series to increase the efficiency even more.

S 8515 vacuum degasser

Working principle

The solvent flows through a short length of Teflon AF® capillary inside a sealed chamber. This chamber (vacuum chamber) is completely sealed to the environment and vacuum is applied with a pump. Due to this vacuum any dissolved gases in the solvent running through the inner capillary are removed through its semi-permeable membrane wall. The high efficiency of the Teflon AF® material allows the usage of a very short length of capillary inside the vacuum chamber.



Technical specifications*

Wetted Materials: Teflon AF®, Teflon, Stainless Steel, Aluminium, EPDM

Degassing Capacity: < 20% dissolved gases remaining in water at 1.0 ml/min

Volumn /Channel: < 500 µl

Dimensions: 125 x 167 x 270 mm (W x H x D)

Weight: 3,2 kg

Power Supply: 100 - 250 V (47—63 Hz)

* depending on configuration

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Order Information S 8515 vacuum degasser

Part-no.	Description
S 8515 – 1A	S 8515 vacuum degasser - 1 Channel
S 8515 – 2A	S 8515 vacuum degasser - 2 Channel
S 8515 – 3A	S 8515 vacuum degasser - 3 Channel
S 8515 – 4A	S 8515 vacuum degasser - 4 Channel
S 8515 – 1AP	S 8515 vacuum degasser - 1 Channel / PEEK—metal free
S 8515 – 2AP	S 8515 vacuum degasser - 2 Channel / PEEK—metal free
S 8515 – 3AP	S 8515 vacuum degasser - 3 Channel / PEEK—metal free
S 8515 – 4AP	S 8515 vacuum degasser - 4 Channel / PEEK—metal free

S 9425 and S 9430 Isocratic High - Pressure Pump

The Schambeck SFD GmbH **Pump HPLC System** is intended for the ambitious analyst. The system configuration is highly variable and several upgrade options make this system suitable for the whole range of analytical applications.

The **HPLC Pump System** is a very flexible and powerful HPLC solvent delivery system.

Its modular setup makes the **HPLC Pump System** one of the most versatile pump systems on the market.

The Pumps **S 9425** and **S 9430** are available as **Isocratic High - Pressure Pump** and **Quaternary Low - Pressure Gradient Pump**.

The **S 9425** and **S 9430 Isocratic High - Pressure Pump** is available with Micro, Analytical or Preparative pump head in Stainless Steel or PEEK.

The **S 9425 Isocratic High - Pressure Pump** is delivered in a small housing. The **S 9430 Isocratic High - Pressure Pump** is delivered in a slightly larger housing (see technical specifications).

The size of the pump housing are adapted to the two different auto samplers (60 vials or 120 vials).

Stepper Motor

The **S 9425** and **S 9430 Isocratic High - Pressure Pump** are driven by high - power stepper motors.

The stepper motor has a much better resolution in the low - flow range than a conventional DC motor.

Lubrication

The **S 9425** and **S 9430 Isocratic High - Pressure Pump** camshafts are constantly lubricated within a sealed chamber to guarantee long lifetime and low maintenance.

Dual-Piston Pump head

The **S 9425** and **S 9430 Isocratic High - Pressure Pumps** use a dual-piston pump head for low pulsation. Together with electronic pressure compensation the pumps are suitable for all analytical tasks in HPLC and GPC.

Optional: Piston Back Flushing

The **S 9425** and **S 9430 Isocratic High - Pressure Pump** heads incorporates an optional active piston back flushing system; this system is interchangeable with old Schambeck SFD GmbH pumps and does not require an additional motor

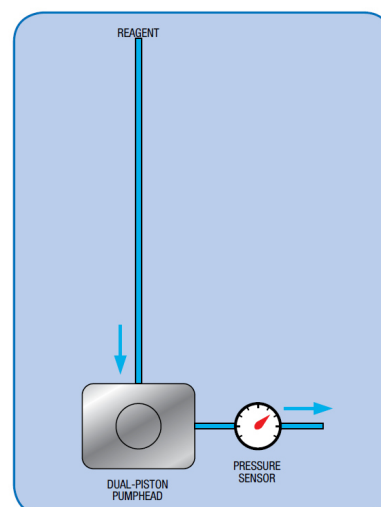


Fig.: S 9425 / S 9430 Isocratic

S 9425 and S 9430 Isocratic High - Pressure Pump

Stepp Motor

The HPLC pumps are driven by a high power stepper motor.

The stepper motor has a much better resolution in the low - flow range than a conventional DC motor.

Lubrication

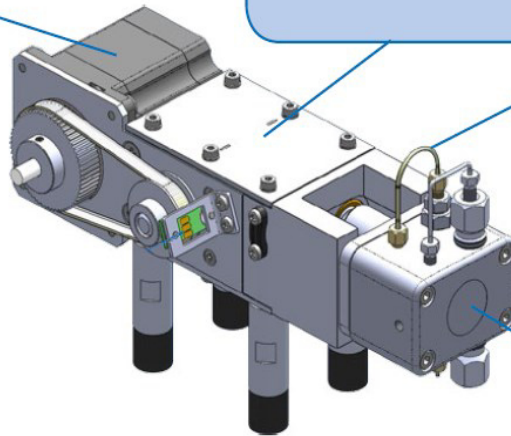
The HPLC pumps camshaft is constantly lubricated within a sealed chamber to guarantee long lifetime and low maintenance.

Optional: Active Piston Back flushing

The HPLC pump head incorporates an automatic piston back flushing system. This system is interchangeable with older Schambeck SFD GmbH pumps and does not require an additional motor.

Dual-Piston Pump head

The HPLC pumps use a dual-piston Pump head for low pulsation. Together with electronic pressure compensation the HPLC pumps are suitable for all analytical tasks in HPLC and GPC.



Technical Specifications*

Wetted Materials:	Stainless Steel / PEEK*, Teflon AF®, PVDF, Ceramics, Sapphire, Ruby	
Flow Rate:	Programmable	
	Micro:	0.001 - 2.000 ml/min.
	Analytical:	0.001 - 10.000 ml/min.
	Preparative:	0.100 - 40.000 ml/min.
Flow Accuracy:	± 1.0 % 1.000 ml/min.	
Flow Precision:	± 0.1 % RSD 1.000 ml/min.	
Pressure Range:	0 – 40 MPa (0 – 6000 PSI)	
Pressure Pulsation:	typical < 0.1 MPa or < 1.0 %	
Compressibility Compensation:	user-adjustable for different solvents	
Dimensions (W x H x D):	S 9425	310 x 165 x 478 mm (W x H x D) (small housing)
	S 9430	396 x 165 x 478 mm (W x H x D) (larger housing)
	The size of the pump housing are adapted to the two different auto samplers (60vials or 120 vials).	
Power Supply:	100 - 250 ~V (47 - 63 Hz)	

* depending on configuration

Order Information S 9425 Isocratic High - Pressure Pump (small housing)

Part-No.:	Description:
S9425ISM	S 9425 Isocratic High - Pressure Pump – Stainless Steel – Micro
S9425IPM	S 9425 Isocratic High - Pressure Pump – PEEK – Micro
S9425ISA	S 9425 Isocratic High - Pressure Pump – Stainless Steel – Analytical
S9425IPA	S 9425 Isocratic High - Pressure Pump – PEEK – Analytical
S9425ISP	S 9425 Isocratic High - Pressure Pump – Stainless Steel – Preparative
S9425IPP	S 9425 Isocratic High - Pressure Pump – PEEK – Preparative
S9425-02	Option: Integrated Active Piston Back Flushing System

Order Information S 9430 Isocratic High - Pressure Pump (large housing)

Part-No.:	Description:
S9430ISM	S 9430 Isocratic High - Pressure Pump – Stainless Steel – Micro
S9430IPM	S 9430 Isocratic High - Pressure Pump – PEEK – Micro
S9430ISA	S 9430 Isocratic High - Pressure Pump – Stainless Steel – Analytical
S9430IPA	S 9430 Isocratic High - Pressure Pump – PEEK – Analytical
S9430ISP	S 9430 Isocratic High - Pressure Pump – Stainless Steel – Preparative
S9430IPP	S 9430 Isocratic High - Pressure Pump – PEEK – Preparative
S9425-02	Option: Integrated Active Piston Back Flushing System

Order Information Spare Parts S 9425 and S 9430 Isocratic Pump

Part-No.:	Description:
2020019	Ceramic Piston - micro
2410020	Primary Piston Seal - micro, grey
2410021	Secondary Piston Seal - micro, white
2020018	Ceramic Piston - analytical
2410015	Primary Piston Seal - analytical, grey
2410016	Secondary Piston Seal - analytical, white
2020020	Ceramic Piston - preparative
2410018	Primary Piston Seal - preparative, grey
2410019	Secondary Piston Seal - preparative, white

Order Information Solvent bottle rack

Part-No.:	Description:
SBR1	Solvent bottle rack include 1000 ml glas bottle

S 9425 and S 9430 Quaternary Low-Pressure Gradient Pump

The Schambeck SFD GmbH **Pump HPLC System** is intended for the ambitious analyst. The system configuration is highly variable and several upgrade options make this system suitable for the whole range of analytical applications.

The **HPLC Pump System** is a very flexible and powerful HPLC solvent delivery system.

Its modular setup makes the **HPLC Pump System** one of the most versatile pump systems on the market.



The Pumps **S 9425** and **S 9430** are available as **Quaternary Low - Pressure Gradient Pump** and also as **Isocratic High - Pressure Pump**.

The **S 9425** and **S 9430 Quaternary Low - Pressure Gradient Pump** is available with Micro, Analytical or Preparative pump head in Stainless Steel or PEEK.

The **S 9425 Quaternary Low - Pressure Gradient Pump** is delivered in a small housing. The **S 9430 Quaternary Low - Pressure Gradient Pump** is delivered in a slightly larger housing (see technical specifications).

The size of the pump housing are adapted to the two different auto samplers (60 vials or 120 vials).

Mixer-Synchronization

Inside the **Quaternary Gradient Pump S 9425** and **S 9430** a low - pressure gradient mixer is synchronized with the piston stroke to achieve highly precise and accurate gradient results.

Stepper Motor

The **S 9425** and **S 9430 Quaternary Low - Pressure Gradient Pump** are driven by high - power stepper motors. The stepper motor has a much better resolution in the low - flow range than a conventional DC motor.

Lubrication

The **S 9425** and **S 9430 Quaternary Low - Pressure Gradient Pump** camshafts are constantly lubricated within a sealed chamber to guarantee long lifetime and low maintenance.

Dual-Piston Pump head

The **S 9425** and **S 9430 Quaternary Low - Pressure Gradient Pump** use a dual-piston pump head for low pulsation. Together with electronic pressure compensation the pumps are suitable for all analytical tasks in HPLC and GPC.

Optional: Piston Back Flushing

The **S 9425** and **S 9430 Quaternary Low - Pressure Gradient Pump** heads incorporates an optional active piston back flushing system; this system is interchangeable with old Schambeck SFD GmbH pumps and does not require an additional motor.

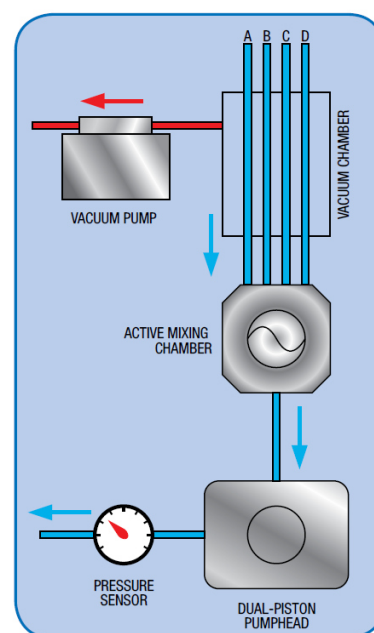


Figure: S 9425 and S 9430 Quaternary Gradient Modul

S 9425 and S 9430 Quaternary Low-Pressure Gradient Pump

Vacuum Pump

The Quaternary Gradient Module features an integrated vacuum pump for online degassing. The advanced Teflon membrane guarantees a long lifetime and maximum chemical compatibility.

Vacuum Chamber

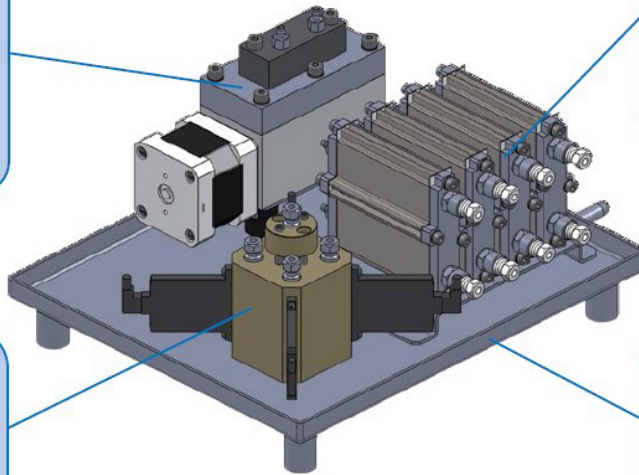
The Quaternary Gradient Module's 4 vacuum chambers are fitted with high efficiency Teflon AF® tubing's for low volume and increased degassing efficiency.

Active Mixer

The Quaternary Gradient Module incorporates an active mixer with adjustable volume for optimized gradient mixing.

Secure Assembly

The Quaternary Gradient Module is assembled on a stainless steel tray with a separate drain to protect the instrument in case of leakages.



Technical Specifications*

Wetted Materials:	Stainless Steel / PEEK*, Teflon AF®, PVDF, Ceramics, Sapphire, Ruby
Flow Rate:	Programmable Micro: 0.001 - 2.000 ml/min. Analytical: 0.001 - 10.000 ml/min. Preparative: 0.100 - 40.000 ml/min.
Mixer Volume:	Adjustable from 10 – 500 µl
Flow Accuracy:	± 1.0 % 1.000 ml/min.
Flow Precision:	± 0.1 % RSD 1.000 ml/min.
Pressure Range:	0 – 40 MPa (0 – 6000 PSI)
Pressure Pulsation:	typical < 0.1 MPa or < 1.0 %
Compressibility Compensation:	user-adjustable for different solvents
Dimensions (W x H x D):	S 9425 310 x 165 x 478 mm (W x H x D) (small housing) S 9430 396 x 165 x 478 mm (W x H x D) (large housing) The size of the pump housing are adapted to the two different auto samplers (60 vials or 120 vials).
Power Supply:	100 - 250 ~V (47 - 63 Hz)

* depending on configuration

Order Information S 9425 Quaternary Low Pressure Gradient Pump (small housing)

Part-No.:	Description:
S9425GSM	S 9425 Quaternary Low Pressure Gradient Pump – Stainless Steel – Micro
S9425GPM	S 9425 Quaternary Low Pressure Gradient Pump – PEEK – Micro
S9425GSA	S 9425 Quaternary Low Pressure Gradient Pump – Stainless Steel – Analytical
S9425GPA	S 9425 Quaternary Low Pressure Gradient Pump – PEEK – Analytical
S9425GSP	S 9425 Quaternary Low Pressure Gradient Pump – Stainless Steel – Preparative
S9425GPP	S 9425 Quaternary Low Pressure Gradient Pump – PEEK – Preparative
S9425-01	Option: Integrated 4 Channel Vacuum Degasser for S 9425 and S 9430 (only for micro and analytical pump head)
S9425-02	Option: Integrated Active Piston Back Flushing System

Order Information S 9430 Quaternary Low Pressure Gradient Pump (large housing)

Part-No.:	Description:
S9430GSM	S 9430 Quaternary Low Pressure Gradient Pump – Stainless Steel – Micro
S9430GPM	S 9430 Quaternary Low Pressure Gradient Pump – PEEK – Micro
S9430GSA	S 9430 Quaternary Low Pressure Gradient Pump – Stainless Steel – Analytical
S9430GPA	S 9430 Quaternary Low Pressure Gradient Pump – PEEK – Analytical
S9430GSP	S 9430 Quaternary Low Pressure Gradient Pump – Stainless Steel – Preparative
S9430GPP	S 9430 Quaternary Low Pressure Gradient Pump – PEEK – Preparative
S9425-02	Option: Integrated Active Piston Back Flushing System

Order Information Spare Parts S 9425 and S 9430 Quaternary Pump

Part-No.:	Description:
2020019	Ceramic Piston - micro
2410020	Primary Piston Seal - micro, grey
2410021	Secondary Piston Seal - micro, white
2020018	Ceramic Piston - analytical
2410015	Primary Piston Seal - analytical, grey
2410016	Secondary Piston Seal - analytical, white
2020020	Ceramic Piston - preparative
2410018	Primary Piston Seal - preparative, grey
2410019	Secondary Piston Seal - preparative, white

Order Information Solvent bottle rack

Part-No.:	Description:
SBR1	Solvent bottle rack include 1000 ml glas bottle

S 9432 Binary High - Pressure Gradient Pump

The Schambeck SFD GmbH **Pump HPLC System** is intended for the ambitious analyst. The system configuration is highly variable and several upgrade options make this system suitable for the whole range of analytical applications.

The **HPLC Pump System** is a very flexible and powerful HPLC solvent delivery system. Its modular setup makes the **HPLC Pump System** one of the most versatile pump systems on the market.



The **S 9432 Binary - High Pressure Gradient Pump** incorporates two pump systems with an optional Active High Pressure Mixer with adjustable chamber volume.

An optional integrated vacuum degasser removes dissolved gases in the eluents and prevents air bubbles in the system. The system is available with Micro, Analytical or Preparative pump head in Stainless Steel or PEEK.

The **S 9432 Binary - High Pressure Gradient Pump** is delivered in a slightly larger housing than HPLC Pump S 9425 (see technical specifications). The size of the pump housing is adapted to the two different auto samplers (60 vials or 120 vials).

Stepper Motor

The **S 9432 Binary - High Pressure Gradient Pump** is driven by high-power stepper motors. The stepper motor has a much better resolution in the low-flow range than a conventional DC motor.

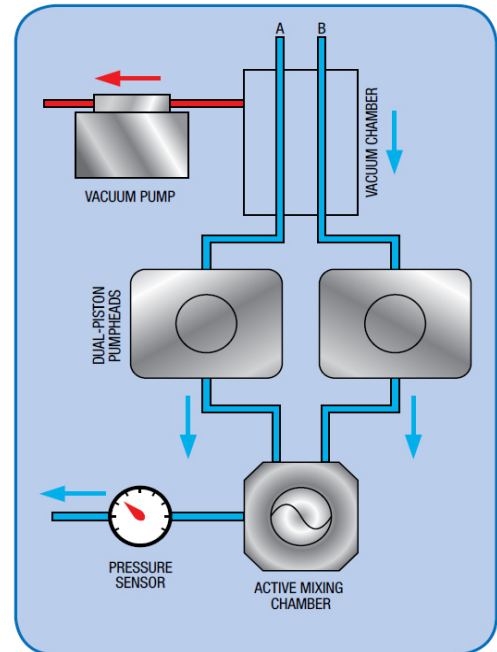


Figure: Flow chart S 9432

Dual-Piston Pump head

The **S 9432 Binary - High Pressure Gradient Pump** uses a dual-piston pump head for low pulsation. Together with electronic pressure compensation the pumps are suitable for all analytical tasks in HPLC and GPC.

Optional: Active High Pressure Mixer

Inside the **S 9432 Binary - High Pressure Gradient Pump** is (Option: only for micro and analytical pump head) an integrated Active High Pressure Mixer to achieve highly precise and accurate gradient.

Optional: Integrated 2 Channel Vacuum Degasser

Inside the **S 9432 Binary - High Pressure Gradient Pump** is (Option: only for micro and analytical pump head) an integrated 2 Channel Vacuum Degasser to remove dissolved gases in the eluents and prevent air bubbles in the system.

Optional: Active Piston Back flushing

The **S 9432 Binary - High Pressure Gradient Pump** heads incorporate an optional active piston back flushing system; this system is interchangeable with old Schambeck SFD GmbH pumps and does not require an additional motor.

S 9432 Binary High - Pressure Gradient Pump

Stepp Motor

The HPLC pumps are driven by a high power stepper motor. The stepper motor has a much better resolution in the low - flow range than a conventional DC motor.

Lubrication

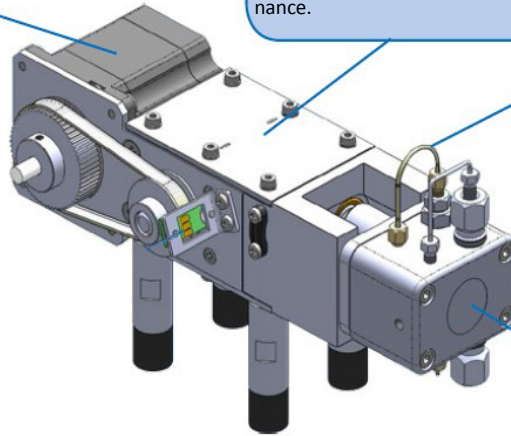
The HPLC pumps camshaft is constantly lubricated within a sealed chamber to guarantee long lifetime and low maintenance.

Optional: Active Piston Back flushing

The HPLC pump head incorporates an automatic piston back flushing system. This system is interchangeable with older Schambeck SFD GmbH pumps and does not require an additional motor.

Dual-Piston Pump head

The HPLC pumps use a dual-piston Pump head for low pulsation. Together with electronic pressure compensation the HPLC pumps are suitable for all analytical tasks in HPLC and GPC.



Technical Specifications*

Wetted Materials:	Stainless Steel / PEEK*, Teflon AF®, PVDF, Ceramics, Sapphire, Ruby
Flow Rate:	Programmable
	Micro: 0.001 - 2.000 ml/min.
	Analytical: 0.001 - 10.000 ml/min.
	Preparative: 0.100 - 40.000 ml/min.
Mixer Volumen:	Adjustable from 10 – 500 µl
Flow Accuracy:	± 1.0 % 1.000 ml/min.
Flow Precision:	± 0.1 % RSD 1.000 ml/min.
Pressure Range:	0 – 40 MPa (0 – 6000 PSI)
Pressure Pulsation:	typical < 0.1 MPa or < 1.0 %
Compressibility Compensation:	user-adjustable for different solvents
Dimensions (W x H x D):	S 9432 396 x 165 x 478 mm (W x H x D) (larger housing)
Power Supply:	100 - 250 ~V (47 - 63 Hz)

* depending on configuration

S 9432 Binary High - Pressure Gradient Pump

Order Information S 9432 Binary High - Pressure Gradient Pump

Part-No.:	Description:
S9432BSM	S 9432 Binary High - Pressure Gradient Pump – Stainless Steel – Micro
S9432BPM	S 9432 Binary High - Pressure Gradient Pump – PEEK – Micro
S9432BSA	S 9432 Binary High - Pressure Gradient Pump – Stainless Steel – Analytical
S9432BPA	S 9432 Binary High - Pressure Gradient Pump – PEEK – Analytical
S9432BSP	S 9432 Binary High - Pressure Gradient Pump – Stainless Steel – Preparative
S9432BPP	S 9432 Binary High - Pressure Gradient Pump – PEEK – Preparative
S9432-01	Option: Integrated 2 Channel Vacuum Degasser (only for micro and analytical pump head)
S9432-02	Option: Integrated Active High Pressure Mixer (only for micro and analytical pump head)
S9425-02	Option: Integrated Active Piston Back Flushing System

Order Information Spare Parts Pump S 9432

Part-No.:	Description:
2020019	Ceramic Piston - Micro
2410020	Primary Piston Seal - Micro, grey
2410021	Secondary Piston Seal - Micro, white
2020018	Ceramic Piston - Analytical
2410015	Primary Piston Seal - Analytical, grey
2410016	Secondary Piston Seal - Analytical, white
2020020	Ceramic Piston - Preparative
2410018	Primary Piston Seal - Preparative, grey
2410019	Secondary Piston Seal - Preparative, white

Order Information Solvent bottle rack

Part-No.:	Description:
SBR1	Solvent bottle rack include 1000 ml glas bottle

S 6250, S 6300 auto samplers

The **S 6250** and **S 6300 auto samplers** are very flexible and powerful HPLC and GPC/SEC auto samplers with excellent reproducibility and linearity properties.

Variable vial racks and adaptors for microtiter plates as well as a multitude of firmware options make this systems highly adaptable and suitable for any analytical application.

Auto sampler S 6250 (60 samples) is in a small housing and the auto sampler S 6300 (120 samples) is in a slightly larger housing (see technical specifications).



Robust design

Durable X/Y/Z-sampling

The **S 6250** and **S 6300 auto samplers** features a mechanically durable X / Y / Z - sampling-mechanic designed for long life operation. The self-lubricating bearings keep the routine maintenance at a minimum and avoid troubles caused by dusty environments. High precision stepper motors drive the X/Y axis for accurate positioning. Micro stepping mode enables a high resolution for the syringe dosing and vial positioning.

Dual-Needle Design

The dual-needle design of the **S 6250** and **S 6300 auto samplers** avoids system blockages due to septum particles injected into the system.

The ventilation needle pierces the septum before the injection needle moves into the sample vial (see figure on the right). As the more fragile injection needle does not need to pierce the vial septum, stronger vial caps or plastic vials can be used without problems.

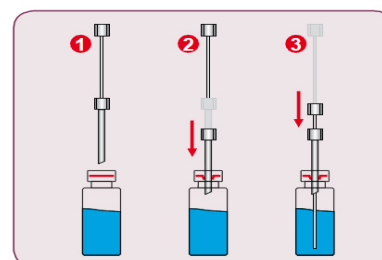


Figure: Dual -Needle injection

Accessibility

The injection valve with sample loop and injection port can be accessed directly from the instrument front without removing any protective covers. The dosing syringe can be accessed from the side of the instrument through a hinged glass panel. The exchange of the syringe can be done without the requirement of any tools.

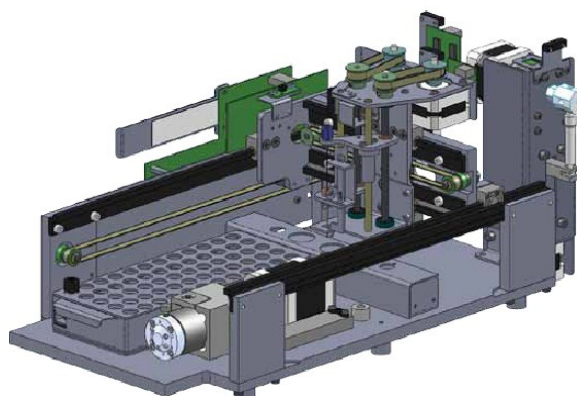


Figure: mechanic design

S 6250, S 6300 auto samplers

Precision & modularity

Performance

The **S 6250** and **S 6300 auto samplers** offers multiple injection modes depending on application and sample needs. Besides fixed loop overfilling and variable volume injection the instrument offers a *Zero-Waste* injection mode for injecting very small sample amounts by moving the sample into the middle of the sample loop. Linearity and injection precision can be optimized for any volume by different sample loops and syringe sizes.

Modular options

The modular nature of the **S 6250** and **S 6300 auto samplers** offers the possibility to “just buy what you need”. Modular options include sample heating/cooling (only for S 6300, Range +4°C (RT-20°C) up to 60°C) for any sensitive sample material and derivatization for automatized pre-column derivatization tasks from reagent derivatization to automatic sample dilution (available 4. quarter 2014)

Technical specifications*

Wetted Materials:	Stainless Steel / PEEK*, PPS, PVDF
Sample capacity:	S 6250 60/90 vials (1.5 ml), 96 (micro titer plates) S 6300 120 vials (1.5 ml), 192 (micro titer plates)
Injection Volume:	Programmable 0.1 - 999.9 µl
Injection Precision:	< 0.5 % Variable Volume Injection (10 µl; typically ~0.25 %)
Linearity:	Correlation Factor > 0.999 (10 µl injection volume, 500 µl Syringe)
Cary Over:	< 0.05 % with wash program
Dimensions:	S 6250 310 x 210 x 478 mm (W x H x D) S 6300 396 x 210 x 478 mm (W x H x D)
Weight:	TBA
Power Supply:	100 - 250 V (47—63 Hz)

* depending on configuration

Order information S 6250 and S 6300 auto sampler

Part-no.	Description
S6250	S 6250 auto sampler , 60 vials (1,5ml) fix injection volume
S6300	S 6300 auto sampler , 120 vials (1,5ml) fix injection volume
S6250-01	Upgrade variable injection volume for auto sampler S 6250 and S 6300
S6250-02	Upgrade cooling/heating for auto sampler S6300 (around 4°C (RT-20°C) up to 60°C)
S6250-03	Upgrade derivatization auto sampler S 6250 and S 6300 (expected to be available 4th quarter 2014)

HPLC/ SEC S 5120 Column Oven

The **S 5120** is a contact heat transfer oven for high temperature stability and accuracy. Up to three 350 mm columns can be mounted at the same time.

The **S 5120 Column Oven** (only heating) has a temperature range base from (ambient +5°C) up to + 150 °C.

S 5120 Column Oven with Heating/Cooling allows to cool down to 4.0 °C (ambient - 15 °C) and up to 100 °C.

The temperature is regulated by peltier elements.

Option for **S 5120 Column Oven**: Temperature / time program.

This option for **S 5120 Column Oven** allows a temperature / time program. So you can use a temperature gradient for HPLC / SEC - columns. The temperature gradient can be freely programmed.



Technical specifications *

Wetted Materials:	Stainless Steel / PEEK*, PTFE, PPS
Temperature Range Base:	(ambient +5°C) up to + 150 °C
Heat/Cool:	(ambient - 15 °C) up to + 100 °C
Temperature Accuracy:	± 0.1 °C
Safety Features:	Temperature fuse, Gas sensor
Time Program:	Programmable, 10 steps (optional)
External Control:	RS232
Dimensions:	183 x 562 x 271 mm (W x H x D)
Weight:	7.0 kg
Power Supply:	100 – 250 V, 47 – 63 Hz

*depending on material option

Operational Conditions:

Ambient Temperature :	+10 °C to +35 °C
Ambient Relative Humidity:	20 to 80 % RH (non-condensing)

Storage Conditions

Ambient Temperature:	-20 °C to +60 °C
Ambient Relative Humidity:	20 to 80 % RH (non-condensing)

Order Information S 5120 Column Oven

Part-No.:	Description:
S 5120	HPLC / SEC - Column oven S 5120 (only heating)
S 5120-01	HPLC / SEC - Column oven S 5120 with Heating/Cooling
S 5120-01-02	Option temperature / time program for HPLC / SEC - Column oven S 5120

C - Oven 2002 for HPLC and GPC/SEC columns

The special **C - Oven 2002** is designed to run from Ambient temperature up to 200°C by its internal program or through the serial com port (RS232).

Up to 12 Jordi GPC DVB columns (500 x 10mm ID) or other columns will fit into the heating compartment.

As the inner dimension of the heating compartment is 100 x 100 x 650 [mm] columns up to a length of 60mm (as well as prep columns) fit without any problem into the oven.

Its possible to run a temperature program (external control— RS232) for high temperature GPC samples.



Technical specifications *

Operational Conditions

Temperature range base:	(ambient + 5°C) up to + 200 °C
Temperature accuracy:	± 0.1 °C
Temperature reproducibility:	± 0.2 °C
Temperature steps:	± 1°C
Heating capacity:	300 W
Digital temperature display	with 0.1 °C resolution
Digital temperature setting	with 0.1 °C resolution
Temperature cut off	up to 20° C above the set temperature
Safety features:	Temperature fuse
Internal control:	via keypad on the device
External control:	RS232
Time program:	Programmable, external RS232
Dimensions column oven outside:	1000 x 210 x 210 mm (W x H x D)
Dimensions columns bath inside:	650 mm x 100 mm x 100 mm (W x H x D)
Weight:	25 kg
Power supply:	220 V, 50 Hz

Order Information C - Oven 2002 for HPLC and GPC/SEC columns

Part-No.:	Description:
C-Oven 2002	HPLC/ GPC Column Oven 2002

S 4245, S 4250 UV/Vis detector

The **S 4245** and **S 4250 UV/Vis detector** is a variable wavelength UV/Vis detector for routine analysis and sophisticated research. The dual lamp design offers a wavelength range of 190 – 900 nm with a low baseline noise. The front-accessible flow cell can easily be exchanged, as can be the lamps which are accessible through a side panel in the instrument housing.



Integrated wavelength program

The **S 4245** and **S 4250 UV/Vis detector** features a wavelength program to change the selected wavelength over time. With this feature the optimum wavelength can be selected for each analysed substance according to its retention time.

Integrated peak detector

The integrated peak detector works as a basic fraction collector. The peak detection level can be freely programmed for peak start and peak end to enhance the collection purity. An integrated 24V output for switching a solenoid valve is used for the fraction collection, which is automatically operated with a selectable time delay.

Optional - dual - wavelength

The **S 4245** and **S 4250 UV/Vis detector** is available with an optional second wavelength. This feature enhances the Wavelength Program feature that you can measure 2 different wavelengths at the same time. A second D/A converter output comes with this option to keep the system flexible to be used with any data acquisition software available.

Optional - online - scan

Another option for the **S 4245** and **S 4250 UV/Vis detector** is the online scan. With the online scan whole spectrum information can be gathered at a certain time. This scan information is stored internally and can be accessed at any time. The Online Scan is a good alternative to a full UV PDA detector.

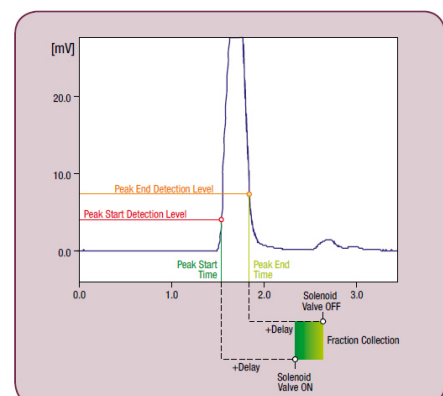


Figure: S 4245 / S4250 Peak detection

Technical Specifications*

Wetted Materials:	Stainless Steel / PEEK*
Baseline Noise:	$\pm 1 \times 10^{-5}$ AU (@240 nm, 1 sec. Rise time)
Baseline Drift:	2×10^{-4} AU/h
Wavelength Range:	190 – 900 nm
Wavelength Accuracy:	± 2 nm
Linearity	> 2.0 AU
Light source:	Deuterium Lamp, Tungsten Lamp
Flow cell volume:	Micro 0,6 μ l, 3,0mm flow path Analytical 7,9 μ l, 10,0mm flow path Preparative 2,7 μ l, 1,5mm flow path
Wavelength Program:	Programmable, 10 Steps
Analog Output:	1 x 1 V (optional: 2 x 1V)
Control Features:	Internal Peak Detector with +24 V solenoid switching output
Dimensions:	S 4245 310 x 165 x 478 mm (W x H x D) S 4250 396 x 165 x 478 mm (W x H x D)
Power Supply:	100 - 250 V (47—63 Hz)

* depending on configuration

Order Information UV/Vis - Detector S 4245 and S 4250

Part-No.:	Description:
UV/Vis 4245	UV/Vis Detector S 4245, 1 Channel
UV/Vis 4245-2	UV/Vis Detector S 4245, 2 Channels
UV/Vis 4245-2S	UV/Vis Detector S 4245, 2 Channels with SCAN Option
UV/Vis 4250	UV/Vis Detector S 4250, 1 Channel
UV/Vis 4250-2	UV/Vis Detector S 4250, 2 Channel
UV/Vis 4250-2S	UV/Vis Detector S 4250, 2 Channels with SCAN Option
UV/VIS—1032009	S 4245 / S 4250 Flow cell, analytical, stainless Steel
UV/VIS—1032010	S 4245 / S 4250 Flow cell, analytical, PEEK
UV/VIS—1032011	S 4245 / S 4250 Flow cell, micro, stainless Steel
UV/VIS—1032012	S 4245 / S 4250 Flow cell, micro, PEEK
UV/VIS—1032013	S 4245 / S 4250 Flow cell, semi-preparative, stainless Steel
UV/VIS—1032014	S 4250 / S 4250 Flow cell, semi-preparative, stainless Steel

Order Information Spare Parts UV/Vis - Detector S 4245 and S 4250

Part-No.:	Description:
47- 4010001	Tungsten Lamp for S 4245 / S 4250, preadjusted
47- 4010002	Deuterium Lamp for S 4245 / S 4250, preadjusted

S 4345 / S 4350 PDA - Detector

The **S 4345 and S 4350 PDA - Detector** are photodiode array (PDA) detectors for routine analysis and sophisticated research.

The dual lamp design offers a wavelength range of 190 – 720 nm (with 256 Diodes) or from 190 - 1015nm (with 1024 diodes) with a low baseline noise.

The front accessible flow cell can easily be exchanged, as can be the lamps which are accessible through a side panel in the instrument housing.



4-Channel UV/Vis - Detector

The **S 4345 / S 4350 PDA - Detector** features 4-Wavelength channels to measure chromatograms at 4 different wavelengths at the same time. With this feature the optimum wavelength can be selected for each analysed substance.

Integrated Peak Detector

The integrated Peak Detector works as a basic fraction collector. The peak detection level can be freely programmed for peak start and peak end to enhance the collection purity. An integrated 24V output for switching a solenoid valve is used for the fraction collection, which is automatically operated with a selectable time delay.

Optional - Analog Output

The **S 4345 / S 4350 PDA - Detector** are available with an optional 4-Channel Analog output. This D/A converter output option is offered to keep the system flexible to be used with any data acquisition software available.

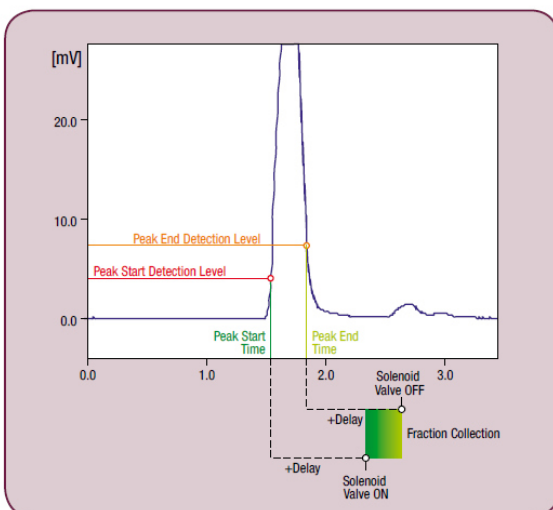


Figure: S 4345 / S 4350 Peak detection

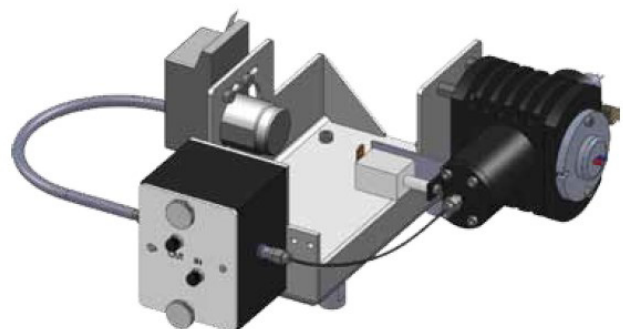


Figure: Optical module S 4345 (256 diodes)

Technical Specifications*

Wetted Materials:	Stainless Steel / PEEK*, Teflon, Glas
Baseline Noise:	$\pm 1 \times 10^{-5}$ AU (@240 nm, 1 sec. Rise time)
Baseline Drift:	$< 3 \times 10^{-4}$ AU/h
Number of diodes:	256 or 1024
Wavelength Range:	190 – 720 nm
Wavelength Accuracy:	0,5 nm (256 Diodes), 0,3 nm (1024 Diodes)
Mean Pixel Pitch:	2,2 nm (256 Diodes), 0,8 nm (1024 Diodes)
Resolution (λ FWHM):	7 nm (256 Diodes), 3 nm (1024 Diodes)
Linearity	> 2.0 AU
Light source:	Deuterium Lamp, Tungsten Lamp
Wavelength Program:	Programmable, 10 Steps
Analog Output:	- (optional: 4 x 1V)
Data Rate:	1 - 100 Hz
Control Features:	Internal Peak Detector with +24 V solenoid switching output
Dimensions:	S 4345 310 x 165 x 478 mm (B x H x T) S 4350 396 x 165 x 478 mm (B x H x T)
Power Supply:	100 - 250 V (47—63 Hz)

Order Information S 4345 and S 4350 PDA - Detector

Part-No.:	Description:
55-S000162	S4350 PDA - Detector - 256 Diodes
55-S000163	S4350 PDA - Detector - 1024 Diodes
55-S000164	S4345 PDA - Detector - 256 Diodes
55-S000165	S4345 PDA - Detector - 1024 Diodes
55-S000169	S 4345 / S 4350 Flow cell, analytical, stainless Steel
55-S000517	S 4345 / S 4350 Flow cell, analytical, PEEK
	Option: 4 Channel Analog Output (available end of 2014)

Order Information Spare Parts S 4345 and S 4350 PDA - Detector

Part-No.:	Description:
55-S000279	Tungsten Lamp for S 4345 / S 4350, preadjusted
55-S000280	Deuterium Lamp for S 4345 / S 4350, preadjusted

S 2020 Refractive index detector

The **Refractive Index Detector S 2020** series provides a consistent enhancement of the already successfully established RID models RI2000 and RI2000-F. The RID S 2020 series offers users 3 times higher sensitivity, (compared to RI2000) stability and reproducibility required for optimal RI detection in HPLC / GPC. By consistently revising the electronic components, it has been possible to significantly improve drift and noise.

The optical system is now better insulated against temperature changes and with programmable temperature settings, ensures a stable baseline and an optimal signal/noise-ratio.

The auto zero, purge, polarity, temperature and the frequency for data output are externally controllable by USB or RS232 Port. RID system status - information such as temperature and total voltage can be externally retrieved by RS232 or USB. The **Refractive Index Detector S 2020** offers communication interface to acquire data directly with Clarity Chromatography Software without using any external signal interface.

The **Refractive Index Detector S 2020** includes - **micro**, - **analytical** and - **semi preparative** refractive index detectors .



Technical Specifications*

	S 2020M, micro	S 2020A, analytical	S 2020P, semi preparativ
Detection Method:	Deflection	Deflection	Deflection
Refractive Index Range:	1.00 to 1.75	1.00 to 1.75	1.00 to 1.75
Flow Rate:	0,2 – 3,0ml/min	0,2 – 3,0ml/min	5 – 50ml/min
Flow Cell Volume	4 µl, 45° angle	9 µl, 45° angle	13 µl, 5° angle
Flow Cell Pressure	6 kg/cm ²	6kg /cm ²	6kg/cm ²
Dead Volume Into cell	6 µl	24 µl	88 or 314 µl *
Linearity Range:	0 - 500 µRIU	0 - 1000 µRIU	0 - 20000 µRIU
Noise Level:	10 x 10 ⁻⁹ RIU	5 x 10 ⁻⁹ RIU	10 x 10 ⁻⁸ RIU
Autozero Range:	Full Range	Full Range	Full Range
Drift with 1ml H₂O/min.	< 1mV/hour	< 1mV/hour	1mV/ hour
Purge Valve	yes	yes	yes / no (depends on flow)
Integrator Output:	+/- 1 Volt	+/- 1 Volt	+/- 1 Volt
Recorder Output:	+/- 10mV / 100mV / 1Volt		
Recorder Offset:	0 mV/10mV/ 100mV		
Recorder Range:	8 steps (1:8) - (16:1)		
Marker:	Yes / No		
Digital Interface:	RS232 / USB bidirectional		
Control of:	Purge, Autozero, Start, Stop, Heater, Data output rate, Polarity		
Current output of:	Temperature optical bench, Optical balance, sum voltage, difference voltage, Alarm (Signal too high/low, A/D out of range, No temp. sensor)		
Data Output Rate:	1 Hz, 2 Hz, 5 Hz, 10 Hz, Lock		
Digital Output TTL:	Intensity Alarm		
Digital Input TTL:	Purge, Autozero, Start, Marker		
Temperature Setting:	Ambient, 35°C to 55°C in 1°C steps, Thermal Fuse 70°C		
Time Constant:	RAW (0,0sec), Fast (0,4sec), Medium (0,8sec), Slow (1,6sec)		
Weigh:	9,6 kg		
Dimensions:	300 x 175 x 440 mm (W x H x D)		
Power Source:	AC 100-120/220-240V, 50/60 Hz, 50VA		
* depending on configuration			

S 2020 Refractive index detector

Order Information Refractive index detector S 2020

Part-No.:	Description:
S 2020, M	Refractive index detector S 2020M, micro
S 2020, A	Refractive index detector S 2020A, analytical
S 2020, P	Refractive index detector S 2020P, semi preparativ

Order Information Spare Parts Refractive index detector S 2020

Part-No.:	Description:
S2020-030	Flow cell, S 2020, micro
S2020-001	Flow cell, S 2020, analytical
S2020-031	Flow cell, S 2020, semi preparativ
S2020-012	Lamp S 2020
S2020-024	Seal kit for flow cell S 2020
S2020-006	Purge valve S 2020

RI 2000 Refractive index detector

The Differential **Refractive Index Detector RI 2000** series offers the sensitivity, stability and reproducibility required for optimal RI detection.

The thermal isolated optic with a counter current heat exchanger and with its programmable temperature control, results in an extremely stable baseline and an optimal Signal / Noise ratio.

The **Refractive Index Detector RI 2000** provides autopurge and autozero capabilities, as well as RS232 communication to acquire data directly without using any external signal interface.



The **Refractive Index Detector RI 2000** offers a communication interface to acquire data directly with Clarity Chromatography Software without using any external signal interface. The **Refractive Index Detector RI 2000** includes: **micro**, **analytical** and **semi preparative** detectors .

Technical Specifications*

	RI 2000M, micro	RI 2000A, analytical	RI 2000P, semi preparativ
Detection Method:	Deflection	Deflection	Deflection
Refractive Index Range:	1.00 to 1.75	1.00 to 1.75	1.00 to 1.75
Flow Rate:	0,2 – 3,0ml/min	0,2 – 3,0ml/min	5 – 50ml/min
Flow Cell Volume	4 µl, 45° angle	9 µl, 45° angle	13 µl, 5° angle
Flow Cell Pressure	6 kg/cm ²	6kg /cm ²	6kg/cm ²
Dead Volume Into cell	6 µl	24 µl	314 µl *
Linearity Range:	0 - 500 µRIU	0 - 1000 µRIU	0 - 20000 µRIU
Noise Level:	5 x 10 ⁻⁹ RIU	5 x 10 ⁻⁹ RIU	5 x 10 ⁻⁸ RIU
Autozero Range:	Full Range	Full Range	Full Range
Drift with 1ml H₂O/min.	< 1mV/hour	< 1mV/hour	1mV/ hour
Purge Valve	yes	yes	yes / no depends on flow
<hr/>			
Integrator Output:	+/- 1 Volt	+/- 1 Volt	+/- 1 Volt
Recorder Output:	+/- 10mV / 100mV / 1Volt		
Recorder Offset:	0 mV/10mV/ 100mV		
Recorder Range:	8 steps (1:8) - (16:1)		
Marker:	Yes / No		
Digital Interface:	RS232		
Control of:	Purge, Autozero, Start, Stop, Heater, Data output rate, Polarity		
Current output of:	Temperature optical bench, Optical balance, sum voltage, difference voltage, Alarm (Signal too high/low, A/D out of range, No temp. sensor)		
Data Output Rate:	1 Hz, 2 Hz, 5 Hz, 10 Hz, Lock		
Digital Output TTL:	Intensity Alarm		
Digital Input TTL:	Purge, Autozero, Start, Marker		
Temperature Setting:	Ambient, 35°C to 55°C in 1°C steps, Thermal Fuse 70°C		
Time Constant:	RAW (0,0sec), Fast (0,4sec), Medium (0,8sec), Slow (1,6sec)		
Weigth:	12 kg		
Dimensions:	220 x 155 x 350 mm (W x H x D)		
Power Source:	AC 100-120/220-240V, 50/60 Hz, 50VA		

* depending on configuration

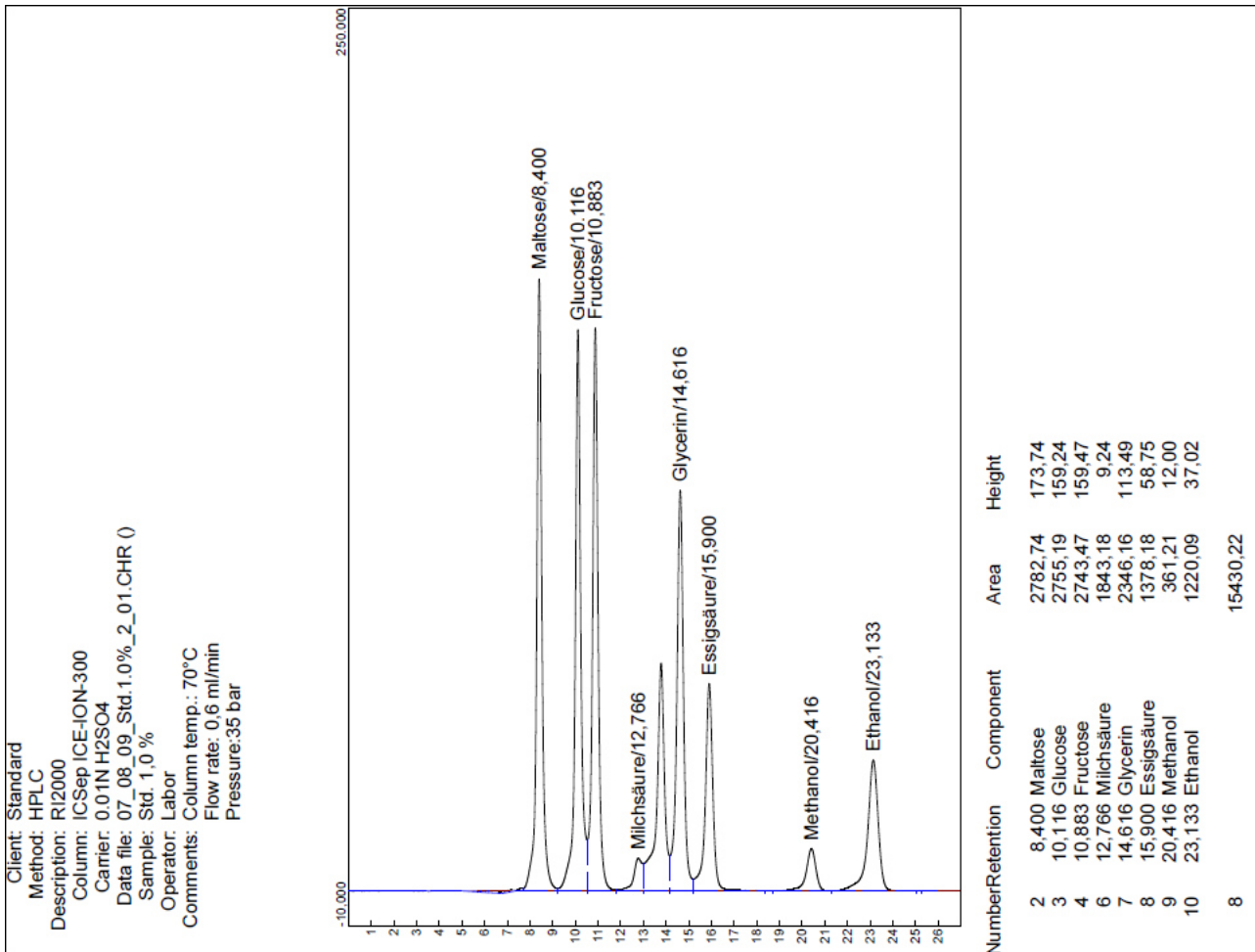
RI 2000 Refractive index detector

Order Information Refractive index detector RI 2000

Part-No.:	Description:
RI2000, M	Refractive index detector RI 2000M, micro
RI2000, A	Refractive index detector RI 2000A, analytical
RI2000, P	Refractive index detector RI 2000P, semi preparativ

Order Information Spare Parts Refractive index detector RI 2000

Part-No.:	Description:
RI2000-030	Flow cell, RI 2000, micro
RI2000-001	Flow cell, RI 2000, analytical
RI2000-031	Flow cell, RI 2000, semi preparativ
RI2000-012	Lamp RI 2000
RI2000-024	Seal kit for flow cell RI 2000
RI2000-006	Purge valve RI 2000



RI 2012 Refractive index detector

The **Refractive Index Detector RI2012** series provides a consistent enhancement of the already successfully established RID models RI2000 and RI2000-F. The RID 2012 series offers users 3 times higher sensitivity, (compared to RI2000) stability and reproducibility required for optimal RI detection in HPLC / GPC. By consistently revising the electronic components, it has been possible to significantly improve drift and noise.

The optical system is now better insulated against temperature changes and with programmable temperature settings, ensures a stable baseline and an optimal signal/noise-ratio.

The auto zero, purge, polarity, temperature and the frequency for data output are externally controllable by USB or RS232 Port. RID system status - information such as temperature and total voltage can be externally retrieved by RS232 or USB. The **Refractive Index Detector RI2012** offers communication interface to acquire data directly with Clarity Chromatography Software without using any external signal interface.

The **Refractive Index Detector RI2012** includes - **micro**, - **analytical** and - **semi preparative** refractive index detectors .



Technical Specifications*

	RI 2012M, micro	RI 2012A, analytical	RI 2012P, semi preparativ
Detection Method:	Deflection	Deflection	Deflection
Refractive Index Range:	1.00 to 1.75	1.00 to 1.75	1.00 to 1.75
Flow Rate:	0,2 – 3,0ml/min	0,2 – 3,0ml/min	5 – 50ml/min
Flow Cell Volume	4 µl, 45° angle	9 µl, 45° angle	13 µl, 5° angle
Flow Cell Pressure	6 kg/cm ²	6kg /cm ²	6kg/cm ²
Dead Volume Into cell	6 µl	24 µl	88 or 314 µl *
Linearity Range:	0 - 500 µRIU	0 - 1000 µRIU	0 - 20000 µRIU
Noise Level:	10 x 10 ⁻⁹ RIU	5 x 10 ⁻⁹ RIU	10 x 10 ⁻⁸ RIU
Autozero Range:	Full Range	Full Range	Full Range
Drift with 1ml H₂O/min.	< 1mV/hour	< 1mV/hour	1mV/ hour
Purge Valve	yes	yes	yes / no (depends on flow)
<hr/>			
Integrator Output:	+/- 1 Volt	+/- 1 Volt	+/- 1 Volt
Recorder Output:	+/- 10mV / 100mV / 1Volt		
Recorder Offset:	0 mV/10mV/ 100mV		
Recorder Range:	8 steps (1:8) - (16:1)		
Marker:	Yes / No		
Digital Interface:	RS232 / USB bidirectional		
Control of:	Purge, Autozero, Start, Stop, Heater, Data output rate, Polarity		
Current output of:	Temperature optical bench, Optical balance, sum voltage, difference voltage, Alarm (Signal too high/low, A/D out of range, No temp. sensor)		
Data Output Rate:	1 Hz, 2 Hz, 5 Hz, 10 Hz, Lock		
Digital Output TTL:	Intensity Alarm		
Digital Input TTL:	Purge, Autozero, Start, Marker		
Temperature Setting:	Ambient, 35°C to 55°C in 1°C steps, Thermal Fuse 70°C		
Time Constant:	RAW (0,0sec), Fast (0,4sec), Medium (0,8sec), Slow (1,6sec)		
Weighth:	9,6 kg		
Dimensions:	300 x 175 x 440 mm (W x H x D)		
Power Source:	AC 100-120/220-240V, 50/60 Hz, 50VA		
* depending on configuration			

RI2012 Refractive index detector

Order Information Refractive index detector RI 2012

Part-No.:	Description:
RI2012, M	Refractive index detector RI 2012M, micro
RI2012, A	Refractive index detector RI 2012A, analytical
RI2012, P	Refractive index detector RI 2012P, semi preparativ

Order Information Spare Parts Refractive index detector RI 2012

Part-No.:	Description:
RI2000-030	Flow cell, RI 2012, micro
RI2000-001	Flow cell, RI 2012, analytical
RI2000-031	Flow cell, RI 2012, semi preparativ
RI2000-012	Lamp RI 2012
RI2000-024	Seal kit for flow cell RI 2012
RI2000-006	Purge valve RI 2012

ZAM 3000 / ZAM 4000 Evaporative Light Scattering Detector

The **Evaporative Lightscattering Detector ZAM 3000 / ZAM 4000** is an universal detector for HPLC. It is used to analyze components which do not have UV absorption, cannot be separated with an isocratic solvent and must use a gradient elution, which cannot be used with a refractive index detector. Only mobile phases without any buffers should be used.

In contrast to other evaporative light scattering detectors all parts of the the **ZAM 3000 / ZAM 4000** detectors which come in contact with the sample are made of PTFE or glass. By this this parts are inert to common solvents and easy to clean. One more advantage of glass parts is the fact that contamination can be located easily.

The nebulization takes place in the glass nebulization chamber. From here the aerosol is guided into the evaporation chamber which is made of glass, too.

The solvent evaporated and only small sample particles reach the detection chamber. Here this particles pass a beam of bright light. By this the light is scatterd in all directions. The scattered light is detected by a photomultiplier in an angel of 120°. The signal is amplified and exported as the detector signal. All parts which get in contact with the sample can be unmount-ed and cleaned easily.

It differs from the **Evaporative Light Scattering Detector ZAM 3000** in the gas flow regulation of the additive gas. The **ZAM 3000** utilizes a mass flow controller which is replaced by a regulation valve in the **ZAM 4000** instruments. As the additive gas flow is not changed in most applications this results in a lower price for the **ZAM 4000**.



Technische Spezifikationen*

Detection Method :	Highly sensitive photomultiplier tube
Nebulizer Material Drying :	Glass, easy to clean, resistant to all common solvents
Chamber Material:	Glass, easy to clean, resistant to all common solvents
Nebulizer Chamber :	Glass, easy to clean, resistant to all common solvents
Material Light Source:	White LED
HPLC Mobile Phase Flow Rate:	0,5 – 3,5 ml/min.
Additiv Gas Controlling:	by Mass flow controller (0,5 – 3,5 l/min.)
Gas Consumption:	~ 1,7 – 4,5 l/min.
Recorder Output:	0 V - +1.2 V
Digital Interface:	RS232 serial port
Digital Input:	AutoZero, Start (Gas on / PMT power) (TTL)
Temperature Settings:	35°C - 85°C, ambient Temperature
Data Smoothing:	Raw, Fast, Slow, Medium
Power Source:	110 V AC / 220 V AC
Dimensions:	180 x 490 x 500 mm (W x H x D)
Weight:	24 kg

* depending on configuration

Order Information

Part-no.	Description
ZAM3000	ZAM 3000 (with Mass flow controller)
ZAM4000	ZAM 4000 (without Mass flow controller)

Application ZAM 3000 and ZAM 4000

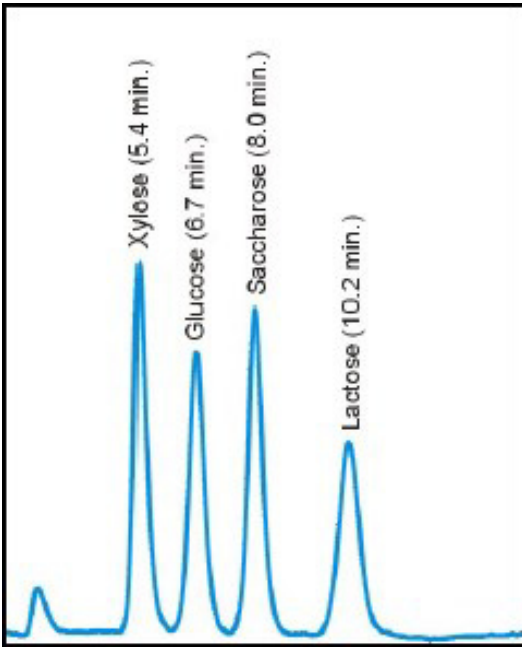


Figure: Analysis of sugars

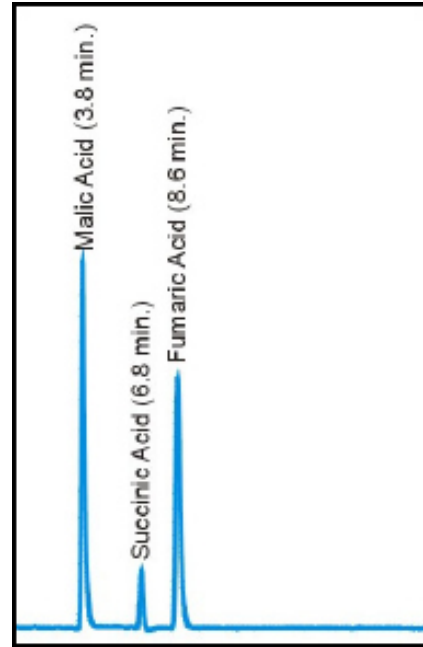


Figure: Analysis of org. acids

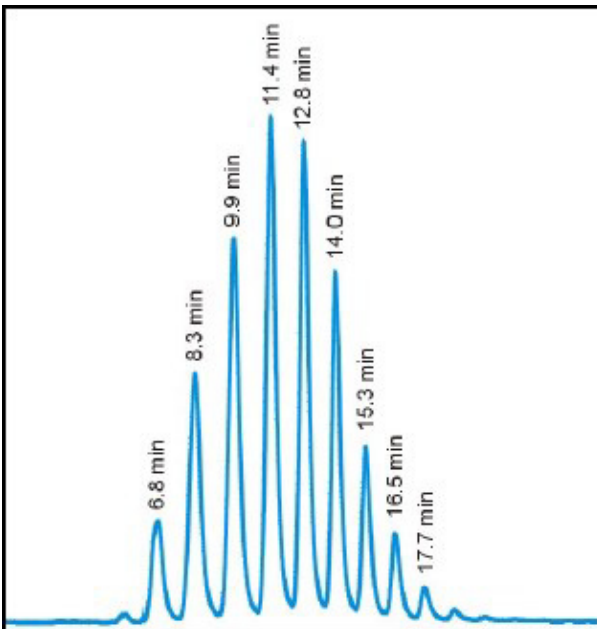


Figure: Analysis of PEG

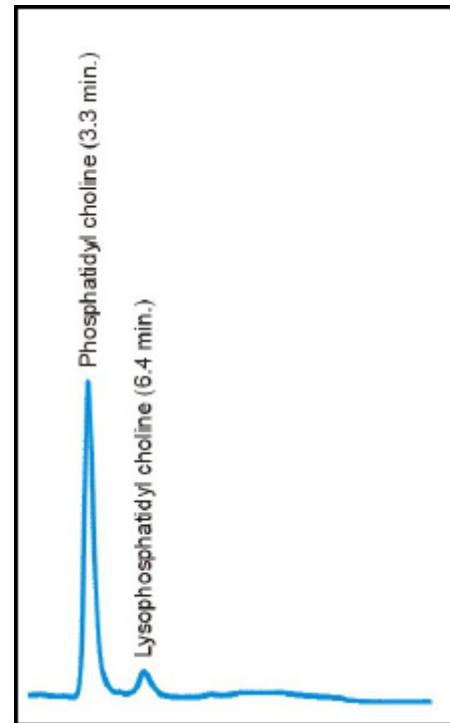


Figure: Analysis of phospholipids

HPLC / GPC Column

We distribute HPLC and GPC / SEC - Separation columns by Jordi Labs and Transgenomic.



Jordi Labs manufactures a complete line of polymer-based high pressure liquid chromatography (HPLC) columns for normal and reverse phase chromatography, size exclusion chromatography, and ion exchange chromatography. All Jordi columns are made from our proprietary chemistries to maximize column life. Each Jordi column is put through a rigorous quality control process and shipped with a quality assurance chromatogram.

Jordi - Columns for aqueous GPC

Jordi offer four phases for aqueous GPC. To select the column that is right for you, please call or email us from our contact page.

Jordi - GPC/SEC Trennsäulen für organische Lösungsmittel

Jordi offers the widest range of stationary phases for organic GPC. As a general rule, hydrophilic samples are best analyzed on our polar phases while hydrophobic polymers should be analyzed on non-polar phases. To speak with a chemist about column selection, please call or email us from our contact page. We have also introduced a series of revolutionary Fluorinated columns. The Teflon like surface chemistry of these gels allows for high speed GPC and reduced sample-column interaction.

Jordi - Guard Columns

Guard columns are an excellent way to protect the investment you have made in your analytical columns. This is especially true when working with unknown samples which may contain reactive or adsorbable materials. A guard column is a shorter version of the analytical column which is sacrificed in order to protect your main column.

Jordi - Normal Phase TColumns

Jordi Normal phase chromatography (NP) is a technique whereby compounds are separated by their polarity as opposed to their hydrophobicity as in RP.

Jordi - Reversed Phase Columns

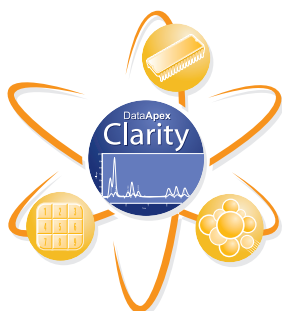
Jordi RP columns represent over 30 years of continuous development effort and are some of the finest polymer based RP columns on the market today.



Transgenomic, Inc. Offer special columns for:

**Ion Chromatography
Proteins/Peptides
Amino Acids
Carbohydrates
Cation Analysis
Glyphosate Analysis Columns
Organic Acids**

Clarity



Chromatography Software from Chromatography Specialists

Clarity is advanced chromatography data station with software modules for data acquisition, data processing, and instrument control.

Its wide range of data acquisition interfaces (A/D converters, LAN, USB, RS232) allows connection to virtually any chromatograph.

- *Easy to install and use*
- *Direct control of chromatography instruments*
- *Modules for specific calculation and methodology*
- *Tools for regulated environment*
- *Extended user support*
- *Competitive pricing*
- *OEM versions*
- *Language localizations*

Clarity Station – simplicity and effectiveness

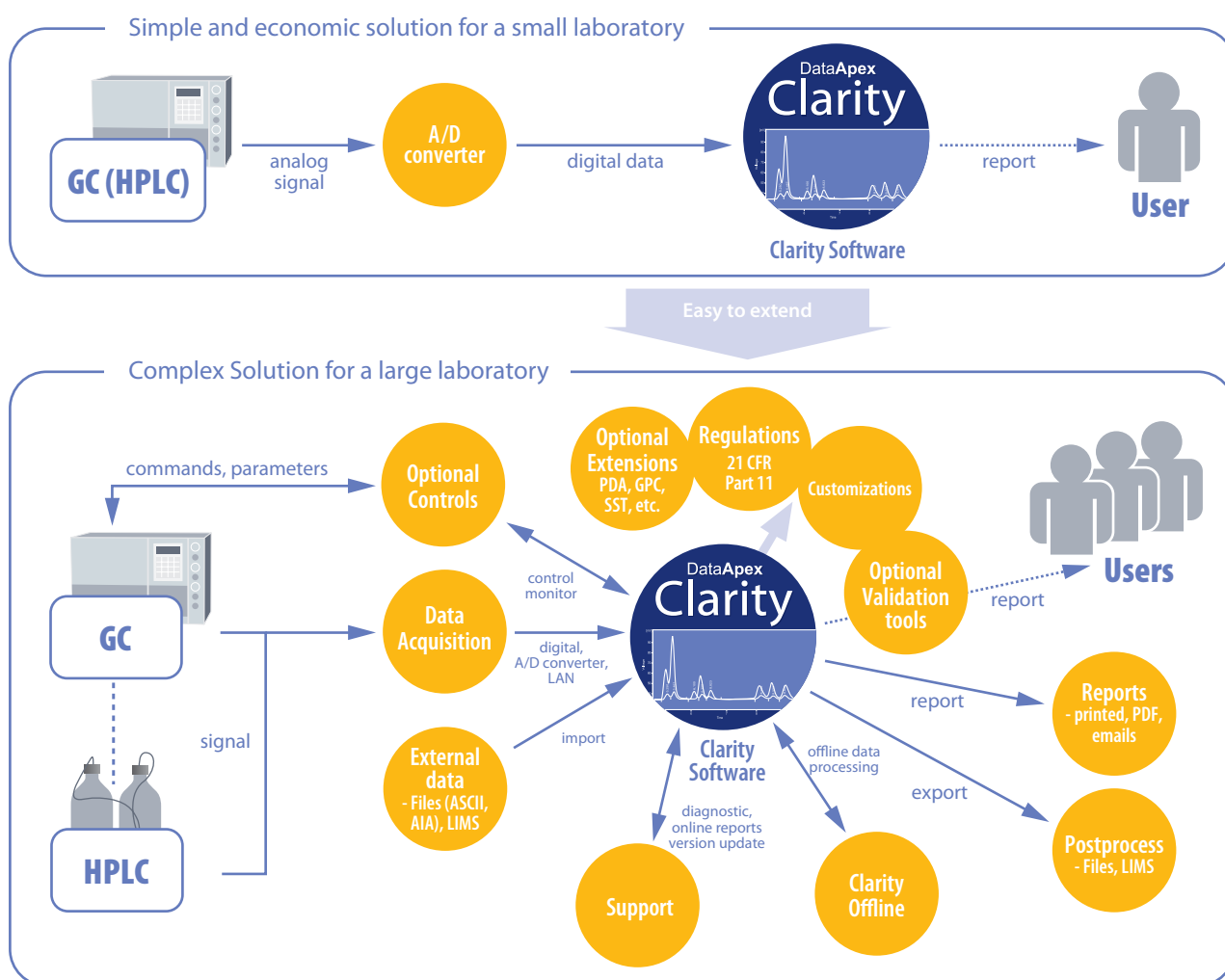
Quick start: Users can start work immediately, without extensive training. Clarity's clear structure and intuitive graphical user interface provide easy access to all frequently performed tasks.

Connectivity: Clarity can easily be integrated into the existing workflow of any laboratory. Use the Export and Import functions or LIMS to exchange data with third party software. A/D converters and control modules connect Clarity to practically any chromatograph. Digital outputs enable control of additional instruments.

Customizable user interface: Clarity can be tailored to meet specific needs. Each user may customize his/her desktop settings, format tables to meet specific requirements, or even create columns for customized calculations.

Simply powerful: Behind the natural, intuitive interface are highly responsive algorithms with a curve smoothing option that enables users to detect hundreds of peaks in each chromatogram. The integration of peaks can be further fine tuned by nearly 30 integration parameters. A variety of quantification and calibration methods is incorporated in the data module.

Customizable computations: Clarity's optional extensions provide powerful features that enable implementation of specific methodologies. Clarity was developed in cooperation with its users; we understand the many and varied needs of chromatographers. Clarity meets those needs.



Clarity Station – scalability

Modular configurations: It is easy to configure a simple solution for a small laboratory with a single chromatograph. When your company expands or needs to change, Clarity can grow with you, into a complex solution for any production facility lab with multiple chromatographs operating in a regulated environment.

Simple and economic solution for small laboratories: Small laboratories can benefit from an inexpensive chromatographic solution with an intuitive user interface without the need for extensive training or complicated initial settings. Users with specific demands can easily incorporate the advanced features and customize the software to meet their specific requirements.

Comprehensive solution for demanding chromatography applications: Larger laboratories usually have three main requirements - efficiency, clear organization of workflow, and data sharing. Clarity can easily address all these requirements with a number of tools.

Automation: Clarity enables sequences, batch processing, automated actions triggered from the event table, etc.

Regulated environment: Tools for GLP (such as user accounts, audit trails for system, methods and parameters of directly controlled instruments); and integration (connectivity to wide range of instruments, import and export to multiple formats, LIMS, etc.).

21 CFR
PART 11

Clarity Product Line

It is easy to select a solution from the wide range of possibilities.

All products in the Clarity product line are based on the same core that has been profoundly tested.

This ensures its stability and reliability.



Clarity: Clarity is the most comprehensive of our stations. Its features include data acquisition from multiple instruments, direct control of GCs, LCs and autosamplers using Controls; access to advanced analyses through Extensions; and support of 21 CFR Part 11. This all makes Clarity suitable for laboratories with high demands on efficiency, high sample throughput and GLP standards.



Clarity Lite: Clarity Lite is a simplified version of Clarity that provides data acquisition from one chromatograph (up to four detectors sharing a common time-base). With its reduced set of functions Clarity Lite is an inexpensive solution for a non-regulated environment. Clarity Lite can be easily upgraded at a later date.



Clarity Offline: The offline version allows users to evaluate data and prepare methods. This version cannot acquire data but it can share data or even directly access (through LAN) projects of the two above-described stations. With Clarity Offline users are able to work with acquired data on additional computers in the lab or at home.



Validation: SW tools for seamless Operational Qualification for both analog and digital data detectors are integral part of Clarity Chromatography Software.

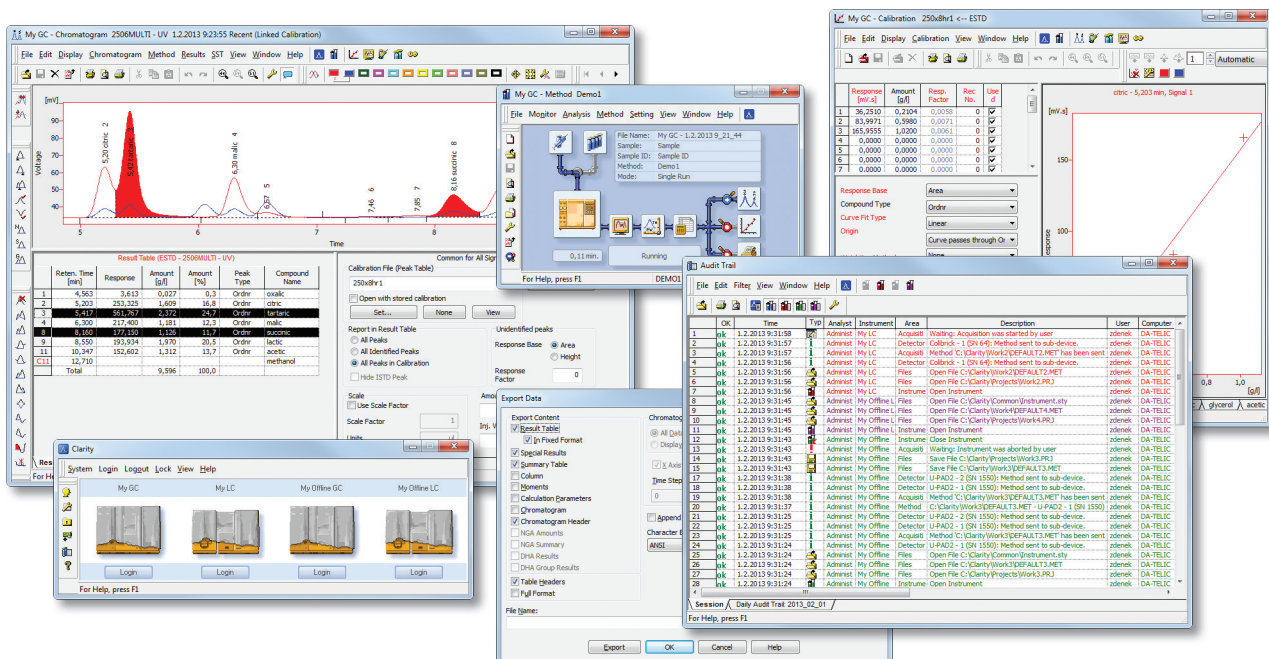
Analog detectors require also a precise peak generator (Validator) that is included in the Validation Kit that can be also used for 3rd party chromatography softwares.



Clarity SDK: The Software Development Kit, for creating custom Control modules for Clarity software, is a set of programming tools with a detailed description of the Clarity Control interface. It is intended for OEM partners to enable development of control modules for their instruments. Use of the SDK requires an advanced command of C++ programming language and MFC libraries.



Clarity OEM: Customize a chromatography station according to your specific requirements. The options range from the simple incorporation of your company name and logo into the Clarity software, all the way up to customizing the entire software to match your specific purposes (CZE, EA, Polarography, Electrochemistry, etc.). Your product will be delivered promptly and with flexible cooperation from our experienced staff.



Clarity Enhancements

Clarity product line includes software Solutions mentioned on the previous page. These can be further supplemented by Extensions, Controls and Hardware.

Clarity Extensions: Software modules that enhance the capabilities of Clarity data station. Extensions provide features within Clarity that are specific to a given type of analysis or for a specific task. Currently available modules are:

GPC: for processing data from Gel Permeation Chromatography

PDA: for spectral data processing

EA: for handling data from Elemental Analyzers

CE: for handling data from a Capillary Electrophoresis systems

SST: for monitoring the accurate function of the chromatography systems

NGA: natural gas analysis calculations

DHA: detailed hydrocarbon analysis calculations

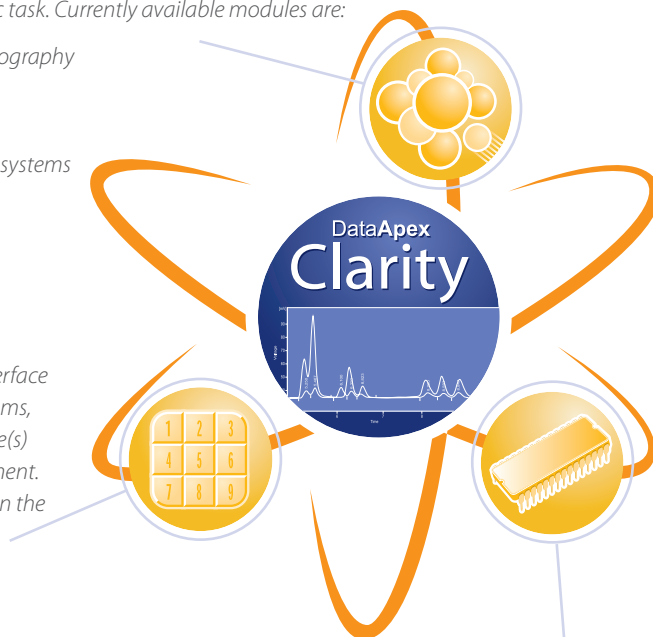
MS: mass spectrometry

Clarity Controls: Software modules that provide an interface with chromatography devices such as GC and HPLC systems, Autosamplers, and Valves. Direct control allows the device(s) to be controlled and monitored from the Clarity environment. The instrument method that controls the device is saved in the measured chromatograms.

A list of currently controlled devices (400+ Instruments) is available at www.dataapex.com.

Hardware: DataApex supplies several types of A/D converters for data acquisition from detectors with analog signal output, control boards for LC control, communication interfaces to controlled instruments, and other optional hardware accessories.

Individual parts are listed in the product catalog at www.dataapex.com.



Clarity Station – extended user support

Lifetime support, free of charge: Clarity not only means "software"; it also comes with extensive free support from DataApex as well as from the growing community of users in the Clarity Discussion forum. Unlike many large corporations, the DataApex Company is in close contact with its users. Not only do we provide support, but we also consider the suggestions, comments and concerns of our customers the kind of valuable input we need for the further and future development of Clarity.

Regular updates: Regular update releases are free of charge. These minor updates result from our ongoing dialog with customers. They not only fix small problems, but also add enhancements that make

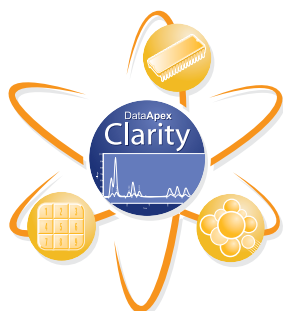
working with Clarity that much more convenient. Clarity software can be set to automatically check for available updates.

Try before you buy: A free **Clarity demo** is available for download so you can explore the features available. The demo includes all features of the Clarity software using sample data. A time limited **Clarity Trial**, using your own actual data, is offered for those who want to evaluate the software in real work.

Pre-sales consultations are available for those who have not yet purchased Clarity.

Local Partner

Clarity GPC Extension

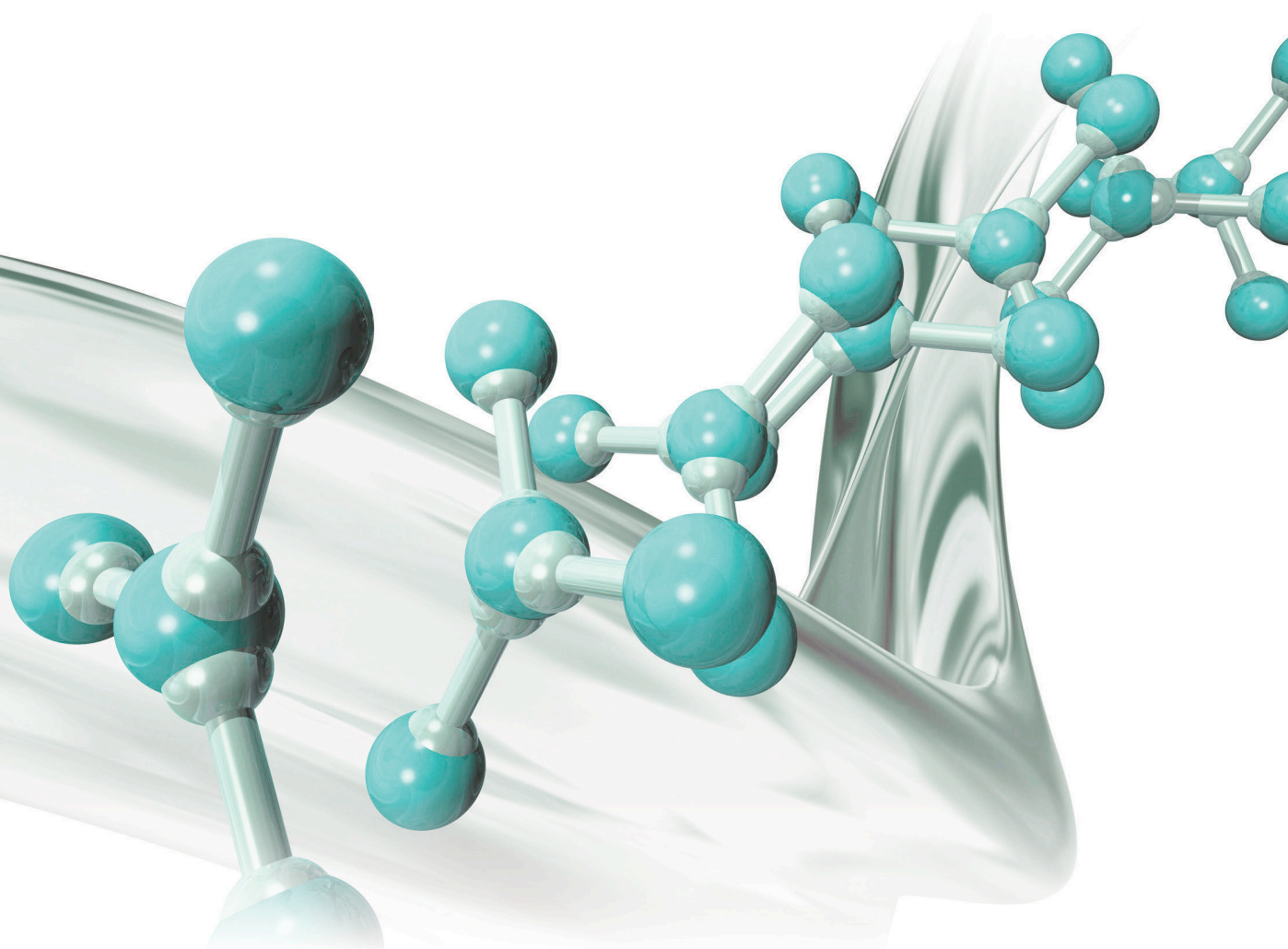


Software module for GPC/SEC (Gel Permeation/Size Exclusion Chromatography)

Gel Permeation Chromatography (GPC) / Size Exclusion Chromatography (SEC) is the technique used for obtaining a rapid and reliable characterization of polymer molecular weight and molecular weight distribution.

GPC Extension provides interactive and automated GPC analysis, including recalibration and GPC reporting, as well as simplifies the retrieval of GPC data. The GPC Extension allows flow rate and multi-detector delay corrections and includes Narrow, Broad and Broad on Narrow calibrations.

GPC Extension is an optional part of Clarity Software, it cannot be used as a standalone program.



CLARITY SOFTWARE

CONTROLS

 EXTENSIONS

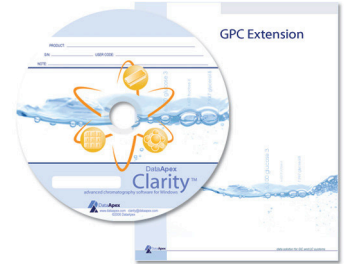
HARDWARE

Clarity GPC Extension

Software module for Gel Permeation / Size Exclusion Chromatography (GPC/SEC)

The GPC Extension (Part No: A28) is an optional, fully integrated part of Clarity software. It can be ordered as a part of new software or as an extension to existing software.

The Clarity Chromatography Software is designed to acquire and evaluate data from up to four multidetector chromatographs at a time (four independent baselines). The Clarity Chromatography Station can acquire data from any HPLC system with standard analog output. GPC mode is selectable for any Instrument within a station. GPC Extension is compatible also with Clarity Offline Software.



Specification

Data Acquisition: Simultaneous data acquisition from up to four chromatographs, detector delay correction for multi-detector measurement.

Data Processing: The same chromatograms can be evaluated in both standard and GPC modes, multiple peaks and multiple signals are processed in one chromatogram.

GPC Integration: Separate integration tables for GPC and standard evaluation are used. There are extensive possibilities for modifying chromatograms. The chromatogram integration can be changed by entering global parameters or interactively, through the direct graphical modification of the baseline.

GPC Calibrations: Narrow, Broad, Broad on Narrow standard calibration methods combined with Flow Rate correction and Universal calibration. Manual calibration or automated recalibration from sequence. Multiple Broad standards can be used.

GPC Calculations: Polynomial ($n=1-5$) curve fits (independent for signals), M_p , M_n , M_w , M_v , M_z , M_z+1 molecular weight averages and polydispersity.

Graphs: Molecular weight distribution graphs.

Overlay: Simultaneously displays a virtually unlimited number of chromatograms. Overlay of $dW/d \log M$ vs $\log M$ and cumulative height graphs.

Export: Slice Table results, graphs, result and summary tables.

User Calculations: User can define custom calculations in the Result and Summary tables. Using the integrated editor you can create your own columns from the original columns and individual mathematical functions.

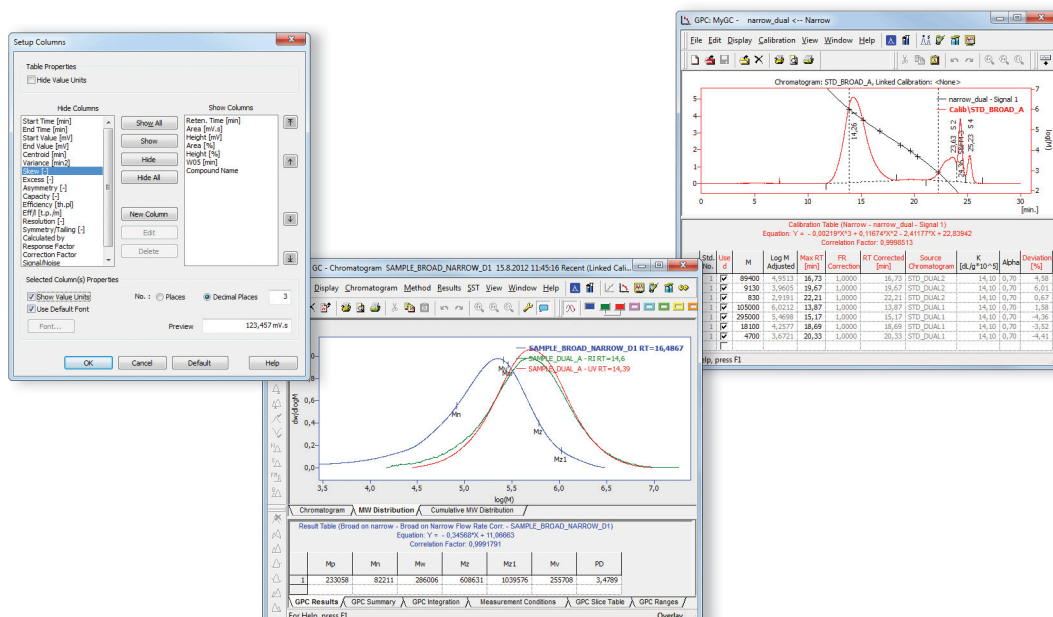
GPC Results Table: Displays molecular weight averages together with peak details for active signal. Multiple peaks can be evaluated from one chromatogram.

GPC Summary Result Tables: Displays and prints selected results from all simultaneously displayed chromatograms.

Post Run: Automatically displays, prints, exports and starts other programs after the completion of a measurement.

Batch: Automatically batch processes, displays, exports or prints any number of chromatograms.

Reports: User selectable report sections and WYSIWYG formatting of Graphs and Tables.





Clarity Chromatography Station – key parameters



Description:	Chromatography software for data acquisition and data processing
SW Package:	SW on a DVD, HW key (dongle), cables, manuals, A/D converter (optional)
A/D converters:	Proprietary only - external USB,TCP/IP
Operating systems:	Microsoft Windows XP, Vista *, 7 * and 8 * (* 32 and 64-bit versions) (Compatibility table - refer to datasheet D016)
PC Requirements:	Refer to datasheet D016 - Compatibility Table for further information.
Number of connected instruments:	Up to 4 chromatographs/Instruments (= up to 4 time basis) at a time Each up to 32 signals/channels
Data acquisition:	Any detector with voltage output: up to 10m distance using USB converters or through Ethernet using the Net-PAD for data acquisition from distant places Digital acquisition: for selected chromatographs, e.g. Agilent, Knauer, etc. (Refer to datasheet D004 - The list of controlled instruments).
Measuring ranges:	Bipolar: 156, 1250, 10000 mV, Integration frequency: up to 400 Hz, 24-bit resolution
GLP/ 21 CFR Part11 requirements:	Password protection/expiration, Electronic signature, Audit Trails, User Accounts with access rights, raw data and history of modifications stored in chromatogram, Validation
Co-operation with autosamplers:	The software cooperates with all autosamplers in active or passive mode by synchronization on TTL signal level. Direct control of selected autosamplers is available (refer to the List of controlled instruments, code D004)
Integration:	27 integration parameters, such as Peak Width, Threshold, Tangent Slope Ratio, etc. Integration parameters are programmable in time, automatic reintegration
Calculation types:	Both without and with calibration (internal and external standard methods), parameters of individual peaks for assessing both the efficiency of the column and the chromatographic system as a whole, SST module for establishing deviations and reproducibility of selected parameters
Calibrations:	6 types of calibration curves, up to 20 levels, Reference Peaks, Groups, unlimited number of standards (peaks), LOD, LOQ
Work with chromatograms:	Overlay of unlimited number of chromatograms, mathematical operations with chromatograms, custom labels and settings for chromatograms
Automation:	Sequences, Post Run - automatic launching of selected commands and applications immediately after the chromatogram acquisition, Batch processing, command line parameters
Presentation of results:	Result and Summary Tables, both integrated and customizable, columns with user-defined calculation, export in text or database format
Calculations:	Custom: 12 predefined mathematical operators, 15 basic and 4 summary functions Special: Kovats indexes, noise/drift determination

Reports:	Custom protocol layouts, Print Preview, Print to PDF file, E-mail report
Data export:	ASCII, AIA, dBase, LIMS
Data import:	ASCII, AIA, LIMS
Multi-user environment	Selectable system of user accounts with independently customizable behavior and appearance for individual users
Network environment:	Easy off-line (at the file level) data sharing among all stations in a local network
Control modules:	<i>refer to datasheet D004 - The list of controlled instruments</i>
Extensions:	GPC, PDA, CE, EA, NGA, DHA, MS, Installation qualification (IQ) Test, Validation Kit, SST module
Supported languages:	Clarity is available in English, Chinese, French, German, Spanish and Russian. Documentation is available in English, selected documentation is available in other languages, see www.dataapex.com for full list of available documentation.
Separate Solutions:	Clarity Lite, Clarity Offline - <i>refer to datasheet D007 for feature comparison</i> Clarity2Go mobile application- <i>refer to datasheet D067 for details</i> SDK – Software Development Kit for external development of control modules OEM version upon request
Support, warranty:	Automatic update from Web, free software updates, free access to on-line knowledge database, on-line technical support, 3 years hardware warranty



Clarity Chromatography Station – Compatibility Table

Compatibility Table

	 Clarity	 Clarity Lite	Note
Windows 8 (64 bit)	INT7, INT9, U-PAD2, Net-PAD, Colibrick	INT7, INT9, U-PAD2, Colibrick	From version 4.0.4
Windows 8 (32 bit)	INT7, INT9, U-PAD, U-PAD2, CB20, Net-PAD, Colibrick	INT7, INT9, U-PAD, U-PAD2, Colibrick	From version 4.0.4
Windows 7, Vista ^{SP2} (both 64 bit)	INT7, INT9, U-PAD2, Net-PAD, Colibrick*	INT7, INT9, U-PAD2, Colibrick*	From version 3.0
Windows 7 (32 bit)	INT7, INT9*, U-PAD, U-PAD2, CB20, Net-PAD, Colibrick*	INT7, INT9, U-PAD, U-PAD2, Colibrick*	From version 2.8
Windows Vista ^{SP2} (32 bit)	INT7, INT9*, U-PAD, U-PAD2, CB20, Net-PAD, Colibrick*	INT7, INT9, U-PAD, U-PAD2, Colibrick*	From version 2.5
Windows XP ^{SP3}	INT7, INT9, U-PAD, U-PAD2, CB20, Net-PAD, Colibrick*	INT7, INT9, U-PAD, U-PAD2, Colibrick*	From version 2.4.4
* Colibrick from version 4.0 - HW dongle required for all systems from version 2.4.0 - Clarity installation may require a minimal Windows service pack version (SP) if specified			

PC Configurations

	Minimal	Recommended
Windows 8, 7, Vista (32 bit, 64 bit)	See respective Windows specification	see respective Windows specification
Windows XP	PC Pentium III/700 MHz, 256 MB RAM	PC Pentium 4/2 GHz, 512 MB RAM
Monitor	Resolution 1024x768, 64K (16 bit High color)	Resolution 1280x1024 or 1680x1050 64K (16 bit High color)
- USB or LPT port for the hardware key (dongle) - USB port for the external A/D converter or full size PCI slot (32 bit PCI slot for 5V 32 bits half-length extension card) for the internal A/D card or LAN port for the Net-PAD - DVD-ROM drive if installed from Clarity DVD media		

HPLC - Systems
GPC/SEC - Systems
Chromatographie - Software
Spare Parts and Accessories
for HPLC and GPC/SEC

Schambeck SFD GmbH
produces since more than 20 years
Systems
and single components
for HPLC and GPC/SEC.

Complete Systems, Vakuum Degasser,
Pumps, Autosamplers and Detectors



use Clarity Software from DataAPEX
with optional software modules for data
acquisition, data processing and
instrument control

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